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Oil and the U.S.S.R.

The most sought-after commodity in the world today is oil: for every full-time uranium seeker with his Geiger counter a hundred petroleum geologists and geophysicists spend their days searching for oil.

The U.S.S.R., the world's third-largest oil producer, exceeded only by the United States and Venezuela, is second only to the United States in amounts consumed. The gap between the two giants is still enormous, but the U.S.S.R., if it chooses the way of peace, has every likelihood of being able to close the gap.

Like the United States, the Soviet Union is remarkable for the extent of its sedimentary basins, i.e. the vast areas made up of layer on layer of clay or sandstone, limestone or other material deposited on the floors of long-vanished seas. With these sediments there sank to the sea floor billions of tons of the partly decomposed remains of minute marine plants and animals. Meanwhile, these sea floors were themselves sinking as the result of profound movements in the earth's crust, and thus sediments were able to accumulate to the thicknesses—as much as 10 miles—that are found in the most prolific oil basins. Age-long compression of the organic matter in the sediments ultimately transmuted it, with the aid of chemical and other processes, into crude petroleum, natural asphalts, and natural gas.

In the Soviet Union more than 20 petroleum-bearing basins, ranging in extent from a few hundred square miles to more than 100,000, have been defined and more than 140 oil fields have been developed, yet exploration has barely begun.

To realize how far it has still to go, we have only to consider some startling figures presented by Mr. Eugene Stebinger. He points out,* taking account of the difference in total area, that up to five years ago the United States had put forth well over 150 times the Soviet effort in oil exploration. He suggests an ultimate yield for the Soviet Union of the order of 168 billion barrels, compared with 100 billion barrels for the United States; but by the end of 1949 less than 6½ billion barrels had been recovered in the U.S.S.R., against 37 billion in the United States. In the first six months of 1950 United States production of crude oil totaled some 927.3 million barrels, and U.S.S.R. crude production some 132.7 million. The 1950 U.S.S.R. production compares with 113.7 million barrels for the first half of 1949, an increase of some 19 million barrels, but United States production for 1950 was, because of falling market conditions, somewhat less than in the corresponding six months of 1949.

The map shows the districts already producing. It

* In his chapter, "The U.S.S.R.," in *World Geography of Petroleum*. See bibliography on last page.

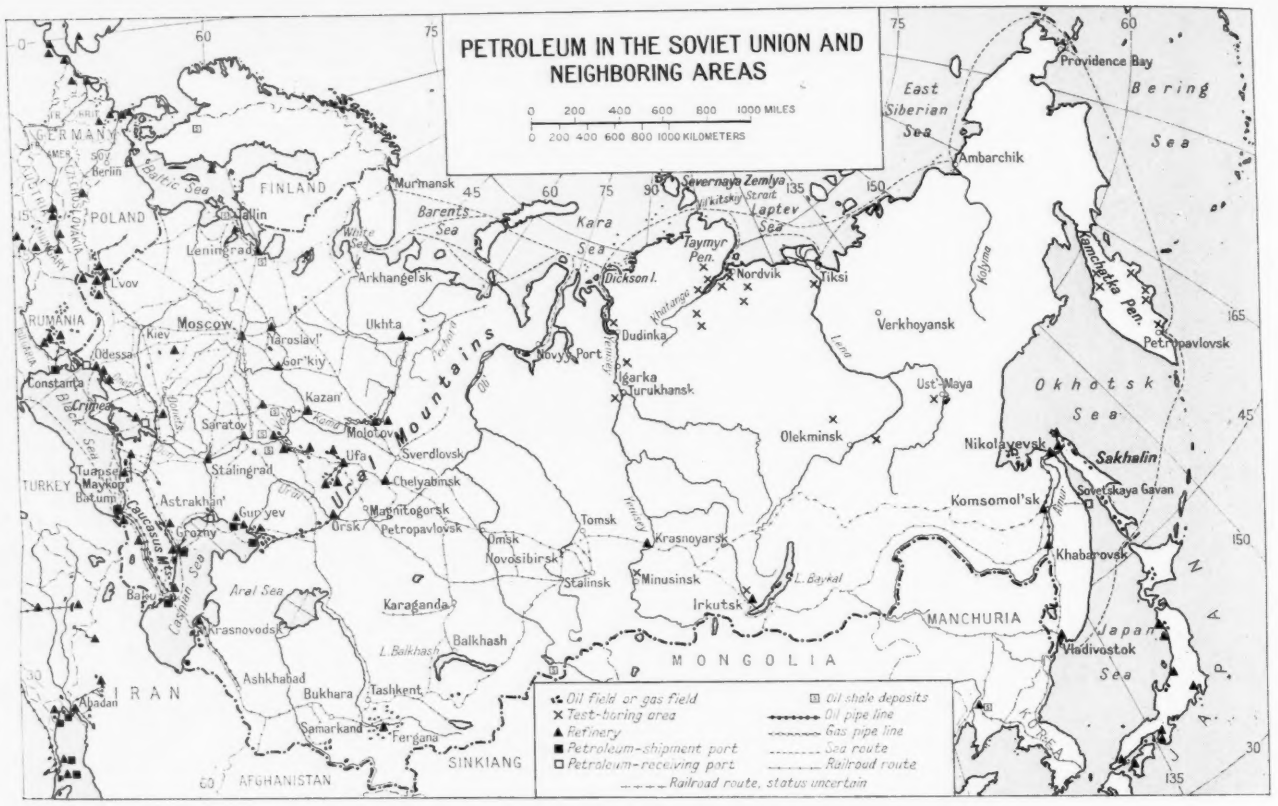

FIG. 1—Petroleum in the Soviet Union and neighboring areas

will be seen that the majority lie within a few hundred miles of the Caucasus or the Urals. Petroleum in the shadow of the frosty Caucasus has been known for a very long time—at least since the time of the Magi, when the Zoroastrians established a fire temple at Baku with the help of local oil seepages.

Modern development dates from 1866, when the first gusher in the Caucasus region was drilled at Maykop. The first well in the Baku fields began to flow in 1871, and by 1879 a steamer, the first ever built with tanks to carry oil, was plying between Baku and Astrakhan'. From that time on, Caucasian oil has been a major factor of the Russian economy. Now, after the destructions of war, the Baku fields, newly electrified, are being further developed, in particular by underwater drilling in the Caspian Sea.

The disadvantages of the forward position of the Caucasus led the Soviets to concentrate on the development of oil and gas fields on the western flank of the Urals, farther from the frontiers and conveniently located between the industrial areas of the Moscow region and those of the Urals and western Siberia. As a result of exploration, a "superlatively rich" producing region, extending on our map west from the Urals to and beyond the Volga, and from the Ural River to the northern side of the Kama River basin, has been revealed, more than two-thirds the area of Texas, and in structure not unlike the west Texas fields. So sensational were its yields that the region was named "The Second Baku."

To the south, between this region and the northern Caspian, are the oil and gas fields of the Emba-Urals'k group. This producing district, third in the Soviet Union in rate of current output, has dotted the Khirgiz steppe, once part of the Khanate of the Golden Horde, with derricks and pipe lines. Of the other oil and gas fields shown on the map in the European U.S.S.R., the most notable are, in the west, the formerly Polish Galician fields and, in the northeast, the small fields in the basin of the Pechora River.

To cross the Ural Mountains is to enter a largely unbroken expanse of potentially favorable territory almost untouched by the drill. Yet the needs of the pioneering movement of people and industries into Soviet Asia, accelerated since the war, give urgency to the development of oil in that immense territory.

The principal production at the present time comes from the Bukhara-Fergana region, on the edge

of the Central Asiatic tableland. The oil fields themselves are in poor steppe, but near by are fertile, populous—and historic—oases. Among the mosques and bazaars of Tamerlane's Samarkand and of Tashkent are now interspersed cotton mills, and most of the oil produced is used in the fast-expanding industrial centers in the oases, though some goes north to Stalinsk.

Second in importance in Soviet Asia are the Turkmen fields, in the steppe east of the Caspian, which ship part of their output by tanker, part by rail. Only a little less is the output of Sakhalin Island in the Pacific, which sends its oil by undersea pipe tanker to the refineries along the Far Eastern rail lines.

How well has Soviet production met Soviet planning? In the Fourth Five-Year Plan, inaugurated in 1946, a production goal of 35.4 million metric tons (258 million barrels) of crude petroleum was set for 1950, as compared with 31.1 million tons produced in 1940. It has been announced that the 1950 target rate was attained by the end of 1949, and that the next goal, to be reached in 1955, is 60 million tons yearly. As new drilling increased much less than crude production, rehabilitation of war-damaged fields probably accounted for a large part of the success. The goal of nearly 8½ billion cubic meters of natural gas has apparently not been fully reached.

Soviet oil transportation is chiefly by water (46 per cent in the latest year for which figures are available, most of it along the Volga system) and by rail (43 per cent), and only 11 per cent by pipe line, whereas in the United States in 1946 pipe lines accounted for some 79 per cent, tankers about 19 per cent, and only 2 per cent was by rail.

In the Arctic, oil cargoes use the Northern Sea Route, in the open season of 70 to 120 days each summer, to supply the depots at the river mouths, and as far as 400 miles upstream at Igarka. A mighty effort has been spent on this route: the building of ports, beacons, lighthouses, air bases, and a network of polar radio stations, the systematic study of sea and ice movements and weather conditions, and the construction of powerful icebreakers (such as the *Josef Stalin*, launched in 1937, of about 11,000 tons and equipped with 10,000 horsepower engines and catapult aircraft).

Total tonnage for the period 1933–1938 averaged 200,000 a year, and it may now be much greater, as the western part of the route is now regarded as "routine." Eastward from the Vil'kitskiy Strait, however, the route is still one of marked hazard.

Striking as are the achievements of the Northern Sea Route, inland Siberia, with its tremendous rate of development—perhaps most nearly comparable with that of the American West in the 19th century—is almost entirely dependent for its petroleum supplies on the trans-Siberian rail lines, an onerous and costly form of transportation. The burden on the railroads throughout the U.S.S.R., and especially on those serving the industrial centers far from oil fields, may have influenced the makers of the 1946–1950 plan to provide for a modest production of oil and gas from oil shale (chiefly from large deposits in Estonia and the Leningrad area) and from coal, as well as for increased outputs of coal gas produced underground. This part of the program, however, has not been reported on.

Statistics on petroleum utilization in the Soviet Union are scanty. Comparative national estimates

FIG. 2—In the Baku area, the Bay of Ilyich oil field viewed from the Caspian Sea. (Sovfoto)